

REMARKS

Claims 1-8, 19, 20, 31, 34 and 37-44 are pending in the present application. Claims 1, 19, 20, 39, 41 and 44 have been amended and claims 9-18, 21-30, 32, 33, 35 and 36 have been canceled by a previous amendment. Claims 1, 19, 20, 39 and 41 are independent. Reconsideration of this application, as amended, is respectfully requested.

Interview with Examiner

An interview was conducted with the Examiner in charge of the present application on April 29, 2008. Applicants greatly appreciate the courtesy shown by the Examiner during the interview. In the Interview with the Examiner, the Examiner's rejections under 35 U.S.C. §§ 112, 102 and 103 were discussed. This will be further emphasized below.

Claim Objections

Claim 44 stands objected to under 37 C.F.R. § 1.75(c) as being in improper form because a multiple dependent claim 43 [cannot depend from another multiple dependent claim]. As the Examiner will note, claim 44 has been amended to delete the dependence on dependent claim 43. Therefore, claim 44 is now in proper form and should be considered by the Examiner.

Claims 1, 19, 20, 39 and 41 stand objected to for a minor informality. As the Examiner will note, claims 1, 19, 20, 39 and 41 have been amended in the manner suggested by the Examiner. Therefore, the claim objection has been obviated.

Rejection Under 35 U.S.C. § 112

Claims 1-8, 19, 20, 31, 34 and 37-43 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

The Examiner asserts that the recitation “while the screen printed viscous medium is still in viscous form” is not supported by application as originally filed. While not conceding to the appropriateness of the Examiner’s rejection, but merely to expedite the prosecution of the present application, the recitation “while the screen printed viscous medium is still in viscous form” has been deleted from the independent claims.

In view of the above amendments and remarks, Applicants respectfully submit that claims 1-8, 19, 20, 31, 34 and 37-43 comply with the written description requirement. Reconsideration and withdrawal of the Examiner’s rejection under 35 U.S.C. § 112, first paragraph, are therefore respectfully requested.

Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1, 8, 19, 20, 39 and 43 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Majd, U.S. Patent No. 5,155,904. Claims 1, 8, 19, 20, 31, 34 and 37-43 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Cook et al., U.S. Patent No. 5,159,171. Claims 2-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Majd or Cook et al. in view of Amir, U.S. Patent No. 5,097,516. These rejections are respectfully traversed.

The present invention is directed to a method of applying viscous medium on a substrate. Each of independent claims 1, 19, 20, 39 and 41 recite a combination of elements including the

recitation “wherein the add-on jetting is non-contact dispensing and the add-on jetting viscous medium is still in viscous form during the add-on jetting” or “wherein the jetting of additional viscous medium is non-contact dispensing and the additional viscous medium is still in viscous form during the jetting of additional viscous medium.” Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest the present invention as recited in the independent claims.

With regard to the Majd reference relied on by the Examiner, this reference discloses a reflow and wave soldering technique for bottom side components. Referring to Figures 2-5 of Majd, solder paste 33 is first applied to the solder pads 32, 34 and 36 using conventional screen printing (see column 5, lines 12-15 of Majd). Glue dots 35, 39 and 41 are then applied on the printed circuit board with a syringe or injection device. Majd specifically refers to the Fuji, FGL-2 Dispensing Machine as the glue dot applicator used (see column 5, lines 20-25 of Majd). Applicants respectfully submit that the Fuji FGL-2 Dispensing Machine is a contact dispenser (needle dispenser), not a non-contact jetting device as in the presently claimed invention (see page 4 of the present specification that defines a jetting device as a non-contact dispensing device and fluid wetting as contact dispensing). In view of this, Majd fails to disclose “add-on jetting ... wherein the add-on jetting is non-contact dispensing” or “jetting additional viscous medium ... wherein the jetting of additional viscous medium is non-contact dispensing” as recited in the independent claims of the present invention.

In order to provide evidence of the fact that the Fuji FGL-2 Dispensing Machine is a contact dispensing device, Applicants have attached a Declaration under 37 C.F.R. § 1.132 from one of the inventors, Dr. William Holm. It is respectfully requested that the Examiner consider

this Declaration as evidence of the fact that the Fuji FGL-2 Dispensing Machine is a contact dispensing device, and therefore, Majd fails to anticipate the independent claims of the present invention.

With regard to the Examiner's reliance on Cook et al., this reference is directed to a method and apparatus for solder laser printing. Referring to Figures 1A-1G of Cook et al., solder 6 is applied to the entire surface of the substrate 2. A laser is then used to reflow the solder and form solidified solder 7. The non-hardened solder 6 is then washed away, so that only the hardened solder 7 remains. A tack media such as a glue dot is then applied to the hardened solder 7. Applicants respectfully submit that the tack media dispenser is a contact needle dispenser and therefore, Cook et al. fails to disclose "add-on jetting ... wherein the add-on jetting is non-contact dispensing" or "jetting additional viscous medium ... wherein the jetting of additional viscous medium is non-contact dispensing" as recited in the independent claims of the present invention.

Cook et al. discloses a method that includes the following steps:

- (1). Apply solder all over a printed circuit board;
- (2). Selectively reflow (laser print) the desired portions of the solder;
- (3). Remove the solder that was not reflowed in step 2;
- (4). Apply tack media;
- (5). Mount components; and
- (6). Reflow the entire board to obtain solder joints between the board and the components.

Step 1 above can be accomplished in a number of different ways in Cook et al. (see column 3, lines 8-11). In all cases; however, the solder is not applied at predetermined positions on the substrate. Instead, step 2 is used to obtain solder at the desired predetermined positions. Thus, the Examiner's argument in paragraph 8 is incorrect. Figure 1C is not obtained after screen printing. Instead, it is the result after the laser printing step.

The closest approximation of add-on jetting in Cook et al. would be step 4, application of tack media. The Examiner is in error when referring to column 4, line 32 to column 5, line 55 in this context, since what is described there are alternative ways of performing steps 1-3. This will be further discussed below with regard to the embodiment of Figure 7.

In view of the above, the only disclosure relating to step 4 in Cook et al. appears at column 2, line 57 to column 3, line 5 and column 3, lines 27 to 40. However, as mentioned above, Cook et al. fails to disclose that the tack media is applied through non-contact dispensing (jetting) as in the presently claimed invention. Therefore, Cook et al. fails to anticipate the independent claims of the present invention.

Cook et al. also discloses a solid solder dispenser 73 in Figure 7. As discussed with the Examiner during the interview, the dispenser 73 cannot be considered to be a jetting device, because the solder is not in viscous form at the time of the jetting. The Examiner indicated that the claims did not clearly set forth that the jetted material is in viscous form during the jetting. In view of this, the independent claims have been amended to recite "the add-on jetting viscous medium is still in viscous form during the add-on jetting" or "the additional viscous medium is still in viscous form during the jetting of additional viscous medium." In view of this, the Examiner cannot consider the dispenser 73 to be the jetting of the presently claimed invention.

Therefore, the second embodiment of Cook et al. also fails to anticipate the independent claims of the present invention.

In addition, in the embodiment of Figure 7, the dispenser 73 is used as an alternative to the embodiments of Figures 1-6. Therefore, the Figure 7 embodiment does not include screen printing as in the presently claimed invention. There is also no suggestion in Cook et al. to merge the embodiment of Figure 7 with the embodiments of Figures 1-6. For this additional reason, Cook et al. fails to anticipate the independent claims of the present invention.

With regard to dependent claims 2-8, 31, 34, 37, 38, 40 and 42-44, Applicants respectfully submit that these claims are allowable due to their respective dependence upon the allowable independent claims, as well as due to the additional recitations in these claims.

With regard to the Examiner's reliance on the Amir reference, this reference has only been relied on for its teaching with regard to inspection of the screen printed and/or jetted viscous medium. Therefore, Amir fails to make up for the above-noted deficiencies of Majd and Cook et al.

In view of the above amendments and remarks, Applicants respectfully submit that claims 1-8, 19, 20, 31, 34 and 37-44 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner's rejections under 35 U.S.C. §§ 102 and 103 are respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted

By 

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